

WE CLAIM:

1. A metallurgical interconnection for electronic devices,
comprising:
 - 5 a first interconnection metal having contact area
 and surface affinity to forming metallurgical
 contacts; and
 - a second interconnection metal capable of
 reflowing;
- 10 wherein said first metal is shaped to maximize said
 contact area, consequently to increase the
 interconnection strength, and to stop nascent
 cracks propagating in said interconnection.
2. The interconnection according to Claim 1 wherein said
15 first metal shape comprises castellations and
 corrugations.
3. The interconnection according to Claim 2 wherein said
 castellation and corrugation is created by stamping or
 etching.
- 20 4. The interconnection according to Claim 1 further
 comprising predetermined contours of said first metal,
 which are arranged in concentric, parallel, or
 repetitive patterns.
- 25 5. The interconnection according to Claim 2 wherein said
 castellation and corrugation are creating grooves
 suitable for venting air during the reflow process by
 which said interconnection is created.
- 30 6. The interconnection according to Claim 1 wherein said
 first metal shape comprises protrusions creating wall-
 like obstacles in the interconnection zones of highest
 thermomechanical stress, whereby propagating cracks are
 stopped.

7. The interconnection according to Claim 1 wherein said first interconnection metal is a copper layer having a thickness between 10 and 30 μm .
8. The interconnection according to Claim 6 wherein said contact area is enlarged at least by a factor of two compared to the area of flat surface geometry.
9. The interconnection according to Claim 1 wherein said first interconnection metal is a copper layer having a thickness between 0.8 and 5 μm .
10. The interconnection according to Claim 9 wherein said contact area is enlarged at least 25 % compared to the area of flat surface geometry.
11. The interconnection according to Claim 1 wherein said surface affinity for metallurgical contacts is provided by a flash of gold, nickel/gold, or nickel/palladium.
12. The interconnection according to Claim 1 wherein said second interconnection metal is selected from a group consisting of tin, tin alloys including tin/indium, tin/silver, tin/bismuth, tin/lead, three-phase alloys, conductive adhesives, and z-axis conductive materials.
13. The interconnection according to Claim 1 wherein said mechanical interconnection strength is created by uniform solder wetting.
14. The interconnection according to Claim 1 wherein said nascent cracks are cracks in the second interconnection metal after reflow, originating at the surface and propagating deeper into and across said reflowed metal.